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CASE REPORT

Anterior segment optical coherence tomography as a diagnostic tool in Descemet membrane detachment in a case with corneal opacity

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Abstract

A 74-year-old male patient, who previously had central corneal opacity, presented to our clinic with decrease in vision, and diffuse corneal edema following uncomplicated phacoemulsification and intraocular lens implantation. With topical treatment of steroids and artificial tears, the edema resolved in peripheral cornea and remained edematous in the central cornea during the following 2.5 months. Optical coherence tomography showed Descemet membrane detachment (DMD) in the edematous area. Intracameral perfluoropropane (C3F8) was injected. In the following days, Descemet membrane reattached and corneal edema resolved. The visual acuity increased to 20/40. Following uneventful phacoemulsification, if corneal edema is refractory to treatment, DMD should be remembered. In cases where corneal opacity interferes with the detailed examination of cornea, optical coherence tomography is helpful. In those patients, C3F8 injection is a viable option even in the late post-operative weeks.

Keywords: Cornea; corneal opacity; Descemet membrane; optical coherence tomography; phacoemulsification.

Descemet membrane detachment (DMD) is a serious but relatively rare complication of cataract surgery. In some instances, it leads to irreversible corneal decompensation if not treated.[1] In DMD, accumulated fluid in the pre-Descemet space and stromal edema leads to loss of vision. Following phacoemulsification, the reported rate of DMD was 0.04%.[2,3]

Herein, we aimed to present a case with a late diagnosed DMD following uncomplicated phacoemulsification surgery and discuss the diagnosis and treatment in the late phase.

Case Report

A 74-year-old male patient presented to our clinic with decreased visual acuity (VA) in the right eye (OD). He has been monitored regularly for blepharitis and dry eye and had a history of phacoemulsification in the left eye (OS) 3 years earlier. On examination, VA was 20/100 in OD and 20/40 in OS. Slit-lamp examination revealed bilateral blepharitis, bilateral central corneal opacity, nuclear cataract OD, and centered posterior chamber intraocular lens (PCIOL) OS. Intraocular pressure (IOP) was 12 mmHg, bilaterally. Fundos-

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copy showed retinal pigment epithelial changes in macula. He had no additional systemic disease. The diagnosis of corneal opacity and cataract was confirmed and the patient underwent uncomplicated phacoemulsification and PCIOL implantation in OD.

At post-operative day-1, his VA was hand motion. He had diffuse corneal edema. He was given topical treatment including moxifloxacine 6×1, prednisolone acetate every two hours, nepafanac sodium 4×1, and dexamethasone ointment at bedtime. Since no change in edema was observed, hypertonic saline solutions and artificial tears were added in the next week. During the following 2.5 months, the corneal edema resolved in the peripheral cornea; however, central cornea remained edematous (Fig. 1). Corneal pachymetry was 764 µm. We obtained an anterior segment optical coherence tomography (AS-OCT) image, which showed a planar DMD in the corresponding edematous area with a diameter of 5.58 mm and pre-Descemet fluid height of 539 µm (Fig. 2). Following, we injected 0.14% perfluoropropane (C3F8) intracamerally. Care was taken not to inject too much to prevent IOP rise. In the following days, Descemet membrane reattached and corneal edema resolved (Fig. 3). The pachymetry at 4th day was 547 µm. No complication related to the gas, such as rise in IOP, was observed. The intracameral bubble, although decreased in size, remained in anterior chamber for almost 3 weeks. At 4th week visit post-injection, the VA increased to 20/40. Slit lamp showed central corneal opacity with mild Descemet folds, and AS-OCT showed normally placed Descemet membrane. In the following 2 years, he had no additional complains.

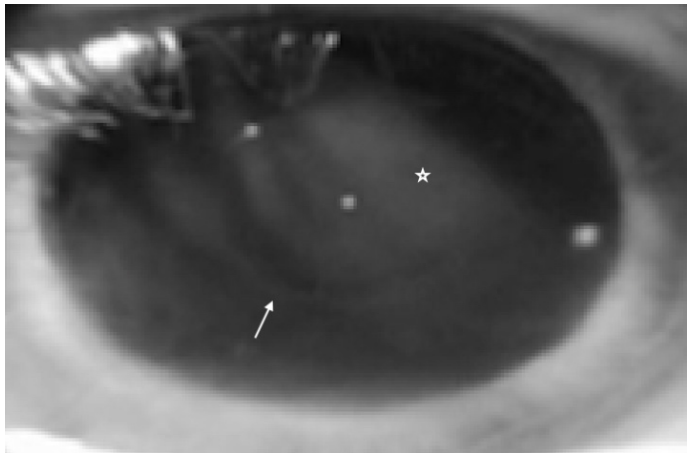

Fig. 1. The anterior segment photography of the cornea at 2.5 months following phacoemulsification. The peripheral cornea is relatively clear. central leukoma (star) is observable with a circular border (arrow).

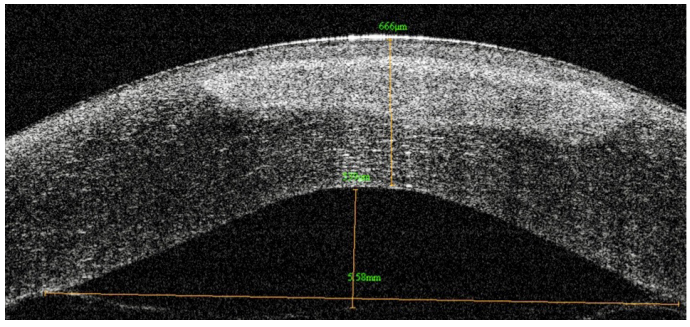

Fig. 2. The anterior segment OCT image of the patient at post-operative 2.5 months: Corneal opacity in the anterior stroma is observable with high reflectivity. A planar Descemet membrane detachment with a diameter of 5.58 mm and pre-Descemet fluid height of 539 µm was recognized.

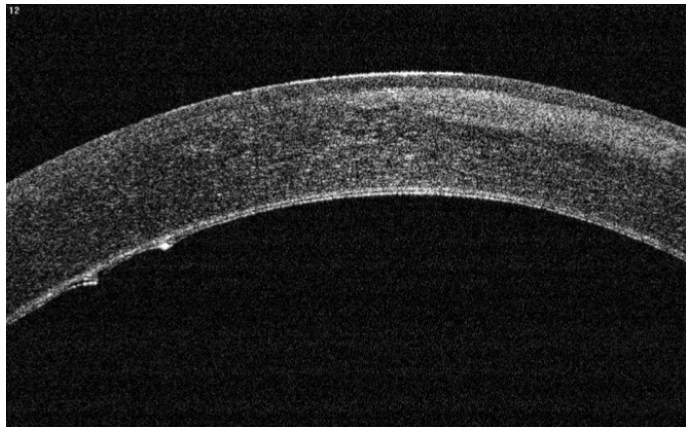

Fig. 3. The anterior segment OCT image at the 4th day following perfluoropropane injection: The Descemet membrane is attached; corneal opacity in the anterior stroma is observable with high reflectivity.

Discussion

Descemet membrane detachment might be observed following complicated cataract surgeries, or anterior segment surgeries such as viscocanalostomy.[4] It is usually not very often seen following uncomplicated surgeries. It is believed that some patients may be predisposed to DMD, such as patients with diabetes mellitus.[5]

In patients who have gone uneventful phacoemulsification, that develop unexpected corneal edema postoperatively, DMD should be suspected. In our case, the dense central corneal opacity obscured the visualization of Descemet membrane. Particularly, a distinct demarcation between the edematous and compact cornea should raise suspicion of DMD. In those cases, AS-OCT is helpful tool.[6] Especially in edematous corneas, it might be critical to identify the intensity of the problem.[7] Using the anterior segment OCT, Kumar et al.[7] developed a protocol called HELP that classified DMD's according to height, extent, length, and

location in relation to pupilla. According to this study, our case with DMD in the central zone, longer than 2.0 mm, and higher than 300 microns should be treated surgically.

Surgery is recommended in cases with significant separation of the membrane from stroma. In case of involvement of visual axis, surgical intervention to promote attachment is usually the preferred approach. Surgical treatment of DMD aims to reapproximate the Descemet membrane against the stroma until it adheres. Treatment alternatives included injection of intracameral air bubble or viscoelastics, suture transfixation of Descemet membrane, injection of isoexpansile gases (sulfur hexafluoride, SF6, or perfluoropropane, C3F8), and corneal transplantation.[6] Anterior chamber injection of gas, namely, descematopexy, is well-accepted treatment in the management of DMD.[8] Success rates of intracameral injections are relatively high.[9] Air as a tamponade had a success rate of 94%.[10] It is absorbed in shortest time as 1–3 days. On the other hand, C3F8 is a longer standing gas. In a study on 67 eyes, intracameral injection of isoexpansile perfluoropropane (14% C3F8) resulted in anatomical reattachment in 71.64% of eyes.[6] We also preferred C3F8 injection in the present case. Considering the late diagnosis of Descemet detachment, we thought that due to its ability of acting longer, it probably might be more advantageous than simple air injection; and so it was.

The time required for resolution of corneal edema after Descemet membrane reapproximation depends on the health of the endothelium. Early attachment leads to better visual reliability because prolonged DMD can result in corneal opacification, fibrosis, and wrinkling of Descemet membrane, thereby affecting visual recovery. Although our case was diagnosed relatively late, 2.5 months postoperatively, the edema resolved in 4 days.

Conclusion

The opacity in cornea might obscure the visualization of DMD. However, when corneal edema is refractory to treatment, DMD should be remembered in patients with corneal opacity even following uneventful phacoemulsification. In those patients, AS-OCT is a useful tool in the diagnosis, and C3F8 injection is a viable option even in the late post-operative weeks.

Informed Consent: Written informed consent was not obtained from the patient since only OCT images were used.

Peer-review: Externally peer-reviewed.

Conflict of Interest: None declared.

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